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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 20

Application Number: 09/840,787
Filing Date: April 23, 2001
Appellant(s): Lal et al.

Barrie D. Greene
For Appellant

EXAMINER'S ANSWER

This is in response to appellant's brief on appeal filed August 8, 2003.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

Claims on Appeal are incorrectly indicated as claims 2-14 and 15-20.

This Appeal involves claims 2-14 and 21.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct. No amendment after final has been filed.

(5) Summary of Invention

The summary of invention contained in the brief is substantially correct however, it additionally includes references to the specification that are appropriately found in the arguments section of the brief and will be addressed in the Response to Arguments section of this Answer.

(6) Issues

The appellant's statement of the issues in the brief is substantially correct.

(7) Grouping of Claims

The appellant's statement in the brief that all claims stand or fall together for both issues on appeal is agreed with.

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Art of Record

Palmieri (1994) FEBS Letters, Vol. 346, pages 48-54 (cited on form PTO-892 mailed May 1, 2002).

Yu et al. (2001) Biochemical Journal, Vol. 353, pages 369-375 (cited on form PTO-892 mailed September 12, 2002).

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 2-14 and 21 stand finally rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility.

Applicants disclose a nucleic acid sequences (SEQ ID NO: 68) encoding the amino acid sequence of SEQ ID NO: 19 (HRM-19). The specification teaches that "HRM-19 is 351 amino acids in length and has eight potential phosphorylation sites at T30, S41, S53, T135, S172, S187, T273 and S331; one potential glucosaminoglycan

site, S_{18}GTG; and one potential mitochondrial motif, P_{31}LDVVKVRL. HRM-19 has sequence homology with C. elegans C16C10 (g577542) and is found in cDNA libraries associated with cell proliferation, cancer and immune response" (page 18, lines 25-28, emphasis added). The specification does not state which, if any, of these processes involves HRM-19. Thus, the specification does not assert any specific utility for HRM-19 and provides no additional evidence that HRM-19 has any specific function. The specification describes generic functions for all HRM encoding polynucleotides. It discloses that polynucleotides encoding any HRM can be used in diagnosis of conditions, disorders, or diseases which are associated with either increased or decreased expression of HRM. Examples of such conditions or diseases include [followed by the non-discriminatory list of cancers of various types ans tissues, immune disorders and other diseases] (page 47, line 24, through page 48, line 6). There is no teaching of any specific diseases or conditions associated specifically with HRM-19. The specification describes generic utility for polynucleotides as being part of microarrays (page 49, line 15, through page 51, line 7) and as a hybridization probe (page 51, line 8, through page 52, line 1). The specification discloses that "polynucleotides used in the microarray may be oligonucleotides that are specific to a gene or genes of interest in which at least a fragment of the sequence is known or that are specific to one or more unidentified cDNAs which are common to a particular cell or tissue type or to a normal, developmental, or disease state" (page 49, line 30, through

page 50, line 1, emphasis added). A DNA encoding SEQ ID NO: 19 does not meet these requirements in that the specification does not teach that a DNA encoding SEQ ID NO: 19 is specific to a gene of interest or is "specific to one or more unidentified cDNAs which are common to a particular cell or tissue type or to a normal, developmental, or disease state".

The sequence search performed by US PTO shows that SEQ ID NO:19 has about 35% homology with a C. *elegans* C16C10 that is defined by GenBank as "similar to carrier protein", i.e similar to a protein for which the function is not established. Taken the above definition as an assertion, even if the protein belongs to a family of proteins, its specific function is still uncharacterized and, in the instant case, is unanticipated as shown by Yu et al. discussed below. Even if this protein is a mitochondrial carrier protein, one of ordinary skill in the art would not know which compound is a substrate for the carrier. Humans produce many mitochondrial carriers and each mitochondrial carrier is expected to have a specific substrate(s) and function that cannot be predicted based on a sequence homology alone. The art teaches that there are many mitochondrial carriers that import various metabolites, nucleotides, cofactors and compounds which are not synthesized in mitochondria (Palmieri, pages 48 and 49, cited on form PTO-892 mailed May 1, 2002). Four years after the effective filing date of the application, Yu et al. (2001) (cited on form PTO-892 mailed September 12, 2002) disclose that while present in mitochondria, the function of CGI-69, which is

HRM-19 with substitution F239L, as a previously uncharacterized protein(abstract, pages 371-372). They teach that CGI-69 does not posses properties common to mitochondrial carrier proteins and that "the unique [cold-induced] carrier CGI-69 does not posses uncoupling behavior, but rather serves a different physiological role in mitochondria (page 374, 2nd column).

Therefore, while HRM-19 is a mitochondrial protein, one of ordinary skill in the art would not know its function except that it is not common to mitochondrial carrier proteins.

Therefore, as disclosed, a protein of SEQ ID NO:19 is an uncharacterized protein with no known specific function.

Furthermore, for a method of detection of a nucleic acid in a sample to be useful, one must know the biological significance of the polypeptide(s) which is(are) being detected. Without this information, the results of the expression profile are useless because one would not know if the polypeptide expression should be increased or decreased or even what significance could be attributed to such changes in expression profiles. Without this knowledge, which could not be gleaned from the instant specification as filed, one of ordinary skill in the art at the time the instant invention was made would not have been able to use the information obtained from an expression profile in a useful manner. There is no evidence to the contrary.

Claims 13, 21 and 14 are drawn to a method for diagnosing an unspecified disease and lung cancer, respectively.

Neither the specification nor the art of record disclose any specific disease or conditions that can be diagnosed using a DNA encoding SEQ ID NO:19. There is no indication that increasing or decreasing the expression of HRM-19 would have any use in diagnosing any diseases. Therefore, diagnosing of an unspecified, undisclosed disease or condition or cancer or immune response would require or constitute carrying out further research to identify or reasonably confirm a disease that can be diagnosed using a DNA encoding SEQ ID NO:19. The specification does not disclose that HRM-19 is differentially expressed in any tissues or in any conditions. There is no teaching in the specification that HRM-19 is associated with lung cancer. Moreover, there is no reason for one of ordinary skill in the art to specifically select lung tissue and not synovial tissue, for example, from which library HRM-19 was identified (specification, page 18, lines 20-21). There is no motivation to specifically select lung tissue ans lung cancer as a tissue and disease from the non-discriminatory list of cancers of various types ans tissues disclosed on page 47, lines 24-29 of the specification. With regard to diagnosis of disease, in order for a polynucleotide to be useful, as asserted, for diagnosis of a disease, there must be a well-established or disclosed correlation or relationship between the claimed polypeptide and a disease or disorder. The presence of a polypeptide/polynucleotide in tissue that is derived from some cancer cells is not

sufficient for establishing a utility in diagnosis of disease in the absence of some information regarding a correlative or causal relationship between the expression of the claimed polypeptide and the disease. If a molecule is to be used as a surrogate for a disease state, some disease state must be identified in some way with the molecule. There must be some expression pattern that would allow the claimed polynucleotide to be used in a diagnostic manner. Many proteins are expressed in normal tissues and diseased tissues. Therefore, one needs to know, e.g., that the claimed polynucleotide is either present only in cancer tissue to the exclusion of normal tissue or is expressed in higher levels in a specific diseased tissue compared to normal tissue (i.e. overexpression). Evidence of a differential expression might serve as a basis for use of the claimed polynucleotide as a diagnostic for a disease. However, in the absence of any disclosed relationship between the claimed polynucleotide and any disease or disorder and the lack of any correlation between the claimed polynucleotide with any known disease or disorder, any information obtained from an expression profile would only serve as the basis for further research on the observation itself.

Therefore, it appears that the main utility of the polypeptide and nucleic acid is to carry out further research to identify the biological function and possible diseases associated with said function. Substantial utility defines a "real world" use. Utilities that require or constitute carrying out further research to identify or reasonably confirm a "real world" context of use are not substantial utility. In view of the above, a DNA

encoding SEQ ID NO:19 and methods of use thereof have no specific, substantial, credible and well-established utility.

Claims 2-14 and 21 stand finally rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

(11) Response to Argument

It is noted at the outset that the claims are interpreted as requiring the entire, specific amino acid or nucleotide sequences that are recited. For example, claim 2, which recites a "polynucleotide comprising a nucleic acid sequence encoding a protein having the amino acid sequence of SEQ ID NO:19" requires nucleotides encoding the entire sequence of SEQ ID NO:19 without substitutions, insertions, or deletions (although the open claim language permits additional sequences before and/or after the recited sequence). Likewise, claim 4, which recites a "polynucleotide consisting of the nucleic acid sequence of SEQ ID NO:68, requires the entire, unaltered sequence of SEQ ID NO:68.

This interpretation of the claims is supported by their literal terms as well as by the prosecution history.

Appellants assert that "use of the claimed polynucleotides for diagnosis of conditions or diseases characterized by expression of HRM-19, for toxicology testing, and for drug discovery are sufficient utilities under 35 U.S.C. §§ 101 and 112" (page 6, II). "These uses are explained, in detail, in the Bedilion Declaration submitted with the Preliminary Amendment mailed December 9, 2002" (page 7, first paragraph). "There is no doubt that the claimed invention is in fact a useful tool in cDNA microarrays used to perform gene expression analysis (page 7, 1st full paragraph). This position is not supported by the specification. It is noted that the specification nowhere mentions toxicology testing, and drug discovery and provides evidence that any specific disease or conditions that can be diagnosed using a DNA encoding SEQ ID NO:19. Nor does the specification disclose what drug(s) HRM-19 would be useful in developing, or what specific disease(s) it would be useful in diagnosing.

This Appellants' position is not agreed with. First, the specification's only disclosure regarding microarrays is found on pages 49-51 and is applied in general to polynucleotides encoding any HRM not specifically HRM-19. That disclosure states only that microarrays "can be used to monitor the expression level of large numbers of genes simultaneously (to produce a transcript image), and to identify genetic variants, mutations, and polymorphisms. This information may be used to determine gene function, understanding the genetic basis of a disease, diagnosing disease, and in developing and monitoring the activities of therapeutic agents" (page 49, lines 16-19).

The specification does not disclose the use of microarrays for toxicology testing. In addition, the specification does not disclose what disorder(s) could be diagnosed using a microarray comprising the claimed polynucleotides, nor what to do with any "therapeutic agents" developed using such a microarray.

Appellants argue that the use of microarrays in such processes is "well-established" and therefore need not be expressly disclosed in the specification. See the Appeal Brief, specifically page 6. Appellants rely on the Bedilion Declaration and scientific papers to support this position. However, the references that Appellants cite on pages 11-14 of the Appeal Brief to show the "well-established" nature of these utilities were all published after the filing date of the instant application and none is concerned with the polynucleotide encoding SEQ ID NO: 19 and the protein of SEQ ID NO:19. Thus, none of Appellants' references provide evidence that, as of the date the present application was filed, those of skill in the art would have recognized the asserted utilities as well-established.

In addition, even assuming arguendo that the use of microarrays to monitor gene expression in research related to toxicology testing, drug development, and disease diagnosis was well-established as the application's filing date, we do not find Appellants' argument persuasive. Furthermore, merely using the claimed polynucleotides as a component of a microarray would not satisfy § 101's utility requirement because not every "use" that can be asserted will be sufficient.

The examiner's position is that the asserted utility of the claimed polynucleotides - as a component of a microarray for monitoring gene expression - does not provide a specific benefit in currently available form.

It is agreed with that a person skilled in the art could attach one of the claimed polynucleotides to a solid substrate, in combination with other polynucleotides, to form a microarray. It is also agreed with that such a microarray could be used to monitor changes in expression of the gene that encodes HRM-19. However, the specification provides no guidance to allow a skilled artisan to use data relating to HRM-19 expression in any practical way. The specification simply provides no guidance regarding what the HRM-19 -specific information derived from a microarray would mean.

Assume, for example, that a fragment of SEQ ID NO:68 was attached to a microarray and the researcher observed that HRM-19 expression was increased when a cell was treated with a particular agent. The specification provides no basis on which a skilled worker would be able to determine whether that result is meaningful. Maybe the meaning in a change in HRM-19 expression would depend on other factors, but again the specification provides no hint what other factors might be important. Would it depend on what agent is used, what cell type is used, the behavior of other genes (if so, which genes and what behavior is significant), the degree of increase? The

specification simply provides no guidance as to how to interpret the results that might be seen using HRM-19 in microarray-based gene expression assay.

In effect, Appellants' position is that the claimed polynucleotides are useful because those of skill in the art could experiment with them and figure out for themselves what any observed experimental results might mean. It is not agreed with that such a disclosure provides a "specific benefit in currently available form." Rather, the instant case seems analogous to Brenner. In Brenner, the applicant claimed a method of making a compound but disclosed no utility for the compound. 383 U.S. at 529, 148 USPQ at 693. The Court held that a process lacks utility if it produces a product that lacks utility. Id. at 534, 148 USPQ at 695. Here, the applicants claim a product asserted to be useful in a method of generating gene-expression data, but the specification does not disclose how to interpret those data. Just as the process claimed in Brenner lacked utility because the specification did not disclose how to use the end-product, the product claims here lack utility, based on their use in microarrays, because the specification does not disclose how to use the HRM-19-specific gene expression data generated by a microarray.

"Appellants respectfully point out that the claimed sequences encoding SEQ ID NO:19 are certainly "specific" to a gene of interest, since the claimed polynucleotides are not mere fragments that could be portions of many genes, but are full-length sequences that encode one specific protein, SEQ ID NO:19" (page 7, 2nd full

paragraph, emphasis added). Appellants continue "given the fact that the claimed polynucleotide is known to be expressed, its utility as a measuring and analyzing instrument for expression levels is as indisputable as a scale's utility for measuring weight. This use as a measuring tool, regardless of how the expression level data ultimately would be used by a person of ordinary skill in the art, by itself demonstrates that the claimed invention provides an identifiable, real-world benefit that meets the utility requirement" (page 9, last paragraph). The examiner disagrees with that analogy because this analogy is fair with regard to scales and microarrays in general. In general, microarrays comprising useful polynucleotides are useful. However, it is not analogous to a microarray which utility is based on the nucleotide of the instant invention. In other words, the addition of a DNA encoding SEQ ID NO:19 to a microarray does not impart the utility if the microarray did not have one. On other hand, the scales are used when there is a reason for the importance of measuring weight. For example, to monitor whether the treatment prevents the weight loss of a cancer patient. The scales invented only to measure weight of something for what the importance of weight is not known are not useful. If a DNA encoding SEQ ID NO:19 would be known to encode a specific function or to be differentially expressed in particular tissues or in certain physiological or pathological conditions, a microarray comprising it would have utility based on that.

Furthermore, MPEP § 2107.01 states that "a claim to a polynucleotide whose use is disclosed simply as a "gene probe: or "chromosome marker" would not be considered to be *specific* in the absence of a disclosure of a specific DNA target. A general statement of diagnostic utility such as diagnosing an unspecified disease, would ordinarily be insufficient absent a disclosure of what condition can be diagnosed" (emphasis added). For the reasons discussed above, the examiner considers said guidelines directly analogous to the instant invention.

Thus, Appellants assert that any expressed human gene or protein can be incorporated into a microarray, and that the microarray can then be used to monitor changes in expression of the genes represented therein. However, any observed results of changed expression of the HRM-19-encoding gene would have no meaning without additional knowledge of what a change in expression of HRM-19 means. The specification in effect discloses that the claimed products can be put on microarrays, and those of skill in the art will figure out what to do with them. This utility is not substantial; it does not provide a specific benefit in currently available form. Appellants' position may be that a microarray has utility, and a microarray is made up of thousands of genes or gene fragments; therefore, since the genes collectively provide the data generated by the microarray, each one of the genes represented in the microarray has utility (pages 10-12). This is not agreed with because of the following.

Assuming arguendo that a generic microarray-one comprising thousands of uncharacterized or semi-characterized gene fragments-would provide a useful tool for, e.g., drug discovery, it does not follow that each one of the genes represented in the microarray individually has patentable utility. Although each gene in the microarray contributes to the data generated by the microarray overall, the contribution of a single gene-its data point-is only a tiny contribution to the overall picture.

The Brenner Court held that § 101 sets more than a de minimis standard for utility. Therefore, the patentable utility of a microarray, for example, does not necessarily mean that each tiny component of the microarray also has patentable utility. A patentable utility divided by a thousand does not necessarily equal a thousand patentable utilities. Each claimed invention must be shown to meet § 101's utility requirement in order to be patentable; it must provide a specific benefit in currently available form. Providing a single data point among thousands or millions, even if the thousands or millions of data points collectively are useful, does not meet this standard.

Appellants further argue that "claimed polynucleotides are useful for measuring the toxicity of drug candidates which are targeted **not** to the claimed polynucleotides or the polypeptides they encode, but to **other genes or proteins**. This utility of the claimed polynucleotides does not require any knowledge of the biological function or disease association of the polynucleotide they encode, and is a specific, substantial

and credible utility" (page 14). To support this view Applicants refer to the work performed with an Incyte gene expression technology and Incyte's genomic information database that do not include HRM-19 or an encoding nucleotide. Further, said work was done in 1999 and 2000, i.e. after the filing date of the current application. Therefore, it is unclear which other genes or proteins can benefit from the use of HRM-19 encoding DNA in a microarray. As discussed above, no such **other genes or proteins** are taught by the specification.

Appellants argue that the fact the claimed polynucleotide encodes a protein in the mitochondrial carrier protein family also demonstrates utility"(Appeal Brief, pages 15-17). Appellants state that "given homology in excess of 30% over many more than 150 amino acid residues, the probability that the polypeptide encoded for the claimed polynucleotide is related to the *C. elegans* mitochondrial carrier protein is, accordingly, very high" (Appeal Brief, page 16, first paragraph; page 25).This is unpersuasive. It is not agreed with because of the following. Appellants nowhere assert that HRM-19 is a mitochondrial carrier protein. HRM-19 has been identified as having "one potential mitochondrial motif". Again, all that Appellants' specification discloses regarding HRM-19 specifically is that it "has sequence homology with C. elegans C16C10 (g577542)" (specification, page 18). Neither the specification nor the prior art show that C. elegans C16C10 (g577542) is a mitochondrial carrier protein. It is annotated in GenBank as "similar to carrier protein". No further information is provided regarding the activity or

function of either the protein encoded by the claimed polynucleotides or the C. elegans C16C10 putative protein with which it has about 35% sequence identity.

The evidence of record shows that mitochondrial carriers have widely varying activities. The specification provides no basis for concluding which, if any, of the activities of the various known mitochondrial carriers is shared by HRM-19. In fact, as shown by Yu et al., *supra*, HRM-19 is not "like the other members of the family". It is agreed that carrier proteins for which their function is known are useful. However, even if HRM-19 is a carrier protein it would require carrying out further research to identify its unique function. The researcher has to carry out further undisclosed experiments to find out in which way the nature made HRM-19 useful. As discussed above, Yu et al., *supra*, refers to the protein as uncharacterized protein and demonstrates that it "does not posses uncoupling behavior, but rather serves a different physiological role in mitochondria" (abstract, page 371, 1st column, page 374, 2nd column, emphasis added). Yu et al. suggest further research to elucidate said role (page 374). Without knowing how HRM-19 functions in mitochondria, its utility as a mitochondrial carrier protein remains unknown. Appellants "point out that the Yu article agrees with Appellants that the HRM-19 is a mitochondrial carrier with a probable role in supporting the enhanced ion and metabolic flux inherent to thermogenic brown adipose tissue" (page 17, lines 1-3). This argument is not persuasive because the role defined by Yu et al. as "probable" in thermogenic brown adipose tissue was never discussed in the

specification. The post filing documents cannot support the role even not probable but established if it was not asserted at the time of filing.

Appellants further refer to the issues discussed in the Declaration of Preeti Lal field September 3, 2002. Applicants state that "new post-filing evidence provided in the Lal Declaration, such as the Yu article which provides experimental evidence that HRM-19 is a mitochondrial carrier protein, serve to **confirm** what was previously asserted" (page 26). Appellants argue that the gene encoding SEQ ID NO:19 is up-regulated in lung tissue samples from cancer patients as compared to matched normal samples from the same patient (Brief, page 26). Regardless of whether these data can provide the support for the utility, said utility is not described in the specification, i.e., there is no mentioning that the gene encoding SEQ ID NO:19 is up-regulated in any disease or in lung cancer. While Appellants refer to the specification on pages 47-49 and 57 (Appeal Brief, page 26) for support, no such support can be found for HRM-19. The specification provides no specific teaching regarding HRM-19 but only the teaching regarding all HRM in general. It teaches that "polynucleotides encoding HRM may be used for the diagnosis" of various diseases of a non-discriminatory list of all human organs (emphasis added, specification, page 47, line 24 through page 48, line 24)". The specification does not disclose that HRM-19 is differentially expressed in any tissues or in any conditions. Moreover, there is no reason for one of ordinary skill in the art to specifically select lung tissue and not synovial tissue, for example, from which

library HRM-19 was identified (specification, page 18, lines 20-21). Thus, the Lal Declaration as post filing document cannot be taken as support for utility that was not asserted at the time of filing. Importantly, Yu et al. teach that "CGI-69 transcript was detected in numerous tissues, with particularly strong abundance in testis and BAT of mice, and testis and kidney of humans (Figure 3)" (page 371, last paragraph).

Appellants argue that the use of polynucleotides in microarrays is a patentable utility, even though they assert that it applies to all expressed genes, because there is no legal requirement that an invention's utility be "particular or unique" to the invention. Rather, Appellants argue, an invention can be a member of a class, where all the members of the class share a common utility (Appeal Brief, pages 27-29).

First, Appellants' characterization of the Office's position is incorrect. Appellants have never been asked to identify a utility that is unique, i.e., not shared by any other compounds or compositions. Rather, Appellants have been required to identify a utility that is specific to the invention claimed, as opposed to one that would apply regardless of the specific properties of the claimed invention. See, e.g., Brenner, 383 U.S. at 534, 148 USPQ at 695 (An invention does not have utility sufficient to satisfy § 101 until it is "refined and developed" to the point of providing a specific benefit in currently available form.).

Appellants assert that any expressed human gene or protein can be incorporated into a microarray, and that the microarray can then be used to monitor

changes in expression of the genes represented therein. However, any observed results of changed expression of the HRM-19-encoding gene would have no meaning without additional knowledge of what a change in expression of HRM-19 means. The specification in effect discloses that the claimed products can be put on microarrays, and those of skill in the art will figure out what to do with them. This utility is not substantial; it does not provide a specific benefit in currently available form. Appellants' position may be that a microarray has utility, and a microarray is made up of thousands of genes or gene fragments; therefore, since the genes collectively provide the data generated by the microarray, each one of the genes represented in the microarray has utility. We decline to attenuate the utility requirement to this degree. Assuming arguendo that a generic microarray-one comprising thousands of uncharacterized or semi-characterized gene fragments-would provide a useful tool for, e.g., drug discovery, it does not follow that each one of the genes represented in the microarray individually has patentable utility. Although each gene in the microarray contributes to the data generated by the microarray overall, the contribution of a single gene-its data point-is only a tiny contribution to the overall picture.

The Brenner Court held that § 101 sets more than a de minimis standard for utility. Therefore, the patentable utility of a microarray, for example, does not necessarily mean that each tiny component of the microarray also has patentable utility. A patentable utility divided by a thousand does not necessarily equal a

thousand patentable utilities. Each claimed invention must be shown to meet § 101's utility requirement in order to be patentable; it must provide a specific benefit in currently available form. Providing a single data point among thousands or millions, even if the thousands or millions of data points collectively are useful, does not meet this standard.

The Brenner Court held that the grant of patent rights to an applicant is justified only by disclosure of an invention with substantial utility - a specific benefit in currently available form. Until the invention has been refined and developed to this point, the Court held, the applicant has not met his side of the bargain, and has not provided a disclosure sufficient to justify a grant of the right to exclude others. See id.

In addition, it is noteworthy that no claims on appeal are drawn to a microarray and only one of the claims (claim 9) recites the microarray on which Appellants base most of their broad assertions of utility. Appellants claim a vector containing a polynucleotide encoding SEQ ID NO:19 and a host and. Neither of these products have any apparent use in a microarray gene-expression assay.

The polynucleotides of the instant claims may indeed prove to be very useful (and valuable), after the in vivo role of the encoded protein is discovered. The work required to confer value on HRM-19, however, remains to be done.

Therefore, for reasons set forth above, Appellants arguments and exhibits have been fully and carefully considered, it is believed that the rejections should be sustained.

Respectfully submitted,

E. Slobodyansky

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October 20, 2003

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